

ABSTRACT OF THE DISCLOSURE

A method is disclosed for coating substantially pure boron or highly boron-rich borides in a controlled manner. Such a method of coating of boron has a variety of applications, including surface chemical and wear protection, neutron absorption, prevention of impurity emission from heated filaments and ion beams, elimination of metal dust from vacuum systems, boridizing, boron cluster emission, and reactive chemistry. Borides with a boron-to-metal ratio of 20 or more are known to exist and may be used as a feedstock for substantially pure boron coatings for deposition processes requiring feedstock electrical conductivity, and/or enhanced reactivity. While most metal borides coincidentally produce significant metal vapor as a by-product, certain borides of yttrium, holmium, erbium, thulium, terbium, gadolinium, and lutetium have been identified as capable of producing substantially pure boron vapor.